

**In the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) A method for depositing crystalline active layers on at least one crystalline substrate from gaseous starting substances, which are introduced, together with a carrier gas, into the process chamber of a reactor, where, depending on process parameters determined in preliminary tests selected from the group consisting of substrate temperature, process chamber pressure, mass flow of the starting substances introduced into the process chamber, total mass flow, and combinations thereof, after prior pyrolytic decomposition, the starting substances are deposited on the substrate and form an active layer having properties selected from the group consisting of stoichiometry, doping, morphology, temperature, growth rate, and combinations thereof determined from surface measurements or measured without contact by sensors acting in the process chamber, characterized in that, in addition to the set of process parameters which contain the process parameters which lead to the desired layer properties, calibration parameters are also determined in the preliminary tests, by the deviations in the layer properties when individual process parameters are varied being determined and the corresponding deviation being placed into a relationship with the process parameter variation, and by, in the production run, prior to the deposition of the active layer, at least one calibration layer, the layer properties of which are measured or determined, being deposited in the same production run, deviation values being formed by placing these properties in a relationship to the desired layer properties, and by one or more process parameters being altered in accordance with the calibration parameters for deposition of the active layer as a function of the magnitude of the deviation values.

2. (Previously presented) The method according to Claim 1, characterized in that the method is an MOCVD method.
3. (Previously presented) The method according to claim 1, wherein the process parameters further comprise source temperature of liquid MOCVD sources.
4. (Previously presented) The method according to claim 1, characterized in that the mass flows are measured and controlled using mass flow controllers.
5. (Previously presented) The method according to claim 1, characterized in that the starting substances also comprise one or more dopants, and the dopant concentration is also determined as a layer property.
6. (Previously presented) The method according to claim 1, characterized in that the stress in the layer is also determined as a layer property.
7. (Previously presented) The method according to claim 1, characterized in that the sensor is a reflection anisotropy spectroscopy (RAS) or an ellipsometer.
8. (Previously presented) The method according to claim 1, characterized in that the sensor for the temperature measurement is a thermocouple or an optical sensor.
9. (Previously presented) The method according to claim 1, characterized in that the in situ measurement is carried out using X-ray diffraction, electron diffraction (REED) or IR reflectometry.
10. (Previously presented) The method according to claim 1, characterized in that the calibration layers comprise a multilayer structure.
11. (Previously presented) The method according to claim 1, characterized in that the layers in the calibration layer sequence have different energy gaps.

12. (Previously presented) The method according to claim 1, characterized in that the calibration layers have different growth rates.
13. (Previously presented) The method according to claim 1, characterized in that the production run, in the event of the desired layer properties not being maintained, is interrupted and/or deposits a covering layer on the layer.
14. (Canceled)
15. (Canceled)
16. (Previously presented) The method according to claim 1, wherein the sensor for the temperature measurement is a pyrometer.